



## Case Report

## Fatal transorbital head injury by bicycle brake handle

Saurabh Chattopadhyay MD (Assistant Professor)<sup>a,\*</sup>, Biswajit Sukul MD (Associate Professor)<sup>b</sup>,  
Sobhan Kumar Das MD (Associate Professor and Head of the Department)<sup>a</sup>

<sup>a</sup> Department of Forensic and State Medicine, Bankura Sammilani Medical College, Bankura, West Bengal, India

<sup>b</sup> Department of Forensic and State Medicine, N.R.S. Medical College, Kolkata, West Bengal, India

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## ABSTRACT

Accidental transorbital head injuries are quite rare. Penetrating head injuries by blunt objects are possible when the site of penetration is through the orbit or the thin temporal bone. The present case is a rare case of transorbital penetrating head injury by a blunt object – bicycle brake handle. Minor external wounds may be misleading and fatal consequences may ensue if cerebral damage is missed on diagnosis. Proper antibiotic coverage to prevent meningitis and neurosurgical intervention can reduce mortality in such cases.

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## 1. Introduction

Transorbital penetrating head injuries are seldom seen in civilian accidents. They may be commonly found in shrapnel injuries, bullets or pellets penetrating the eyes or stab injuries.<sup>1</sup> Fatalities in such penetrating injuries may be rapid due to vascular injuries or damage to vital centers in the brain or delayed due to complications. Chances of complications are higher when foreign bodies are lodged in the cranial cavity.<sup>2</sup> Small and innocuous external wounds on the eyelids may be misleading and fatal intracranial injuries may be missed if proper examination and investigations are not done.

## 2. Case report

An 8 years old boy while running with a bicycle along the village road suddenly slipped and fell down. On shouting for help the by passers found that the brake handle had penetrated into the left eye. He was rescued from the spot and admitted to the hospital 2.5 h after the incident. On admission he was unconscious and the left eye was swollen. CT scan revealed fracture of the left orbital roof. Only conservative management was done by antibiotics. The boy expired 4 days later.

Autopsy examination revealed a lacerated wound measuring 1.5 cm × 1 cm × through and through on the left upper eyelid (Fig. 1). Subconjunctival haemorrhage and extravasation of blood in the peri orbital tissues was also noted resulting in bulging of

the eye ball. On dissection of the head the orbital plate of the frontal bone on the left side was fractured (Fig. 2) and the floor of the left side frontal lobe of the brain was lacerated (Fig. 3). Fragments of bone were recovered from the brain. Diffuse subarachnoid haemorrhage was also noted.

## 3. Discussion

Transorbital intracranial penetrating injuries by bicycle brake handles have rarely been reported. The present case is the fourth reported case of its type. Out of the previous three cases two were fatal.<sup>3–5</sup> Unusual penetrating injuries of the brain by paint brush,<sup>6</sup> wooden and metal chopsticks<sup>7</sup> have also been reported previously. In the present case penetration by the blunt brake handle was favored by certain factors – (i) The victim was a boy aged 8 years where the bones are not much thick to offer great resistance. (ii) Penetration occurred through the orbital roof which is a very thin plate of bone. Faraji<sup>8</sup> in his study has pointed out that the common sites of penetration of the cranial cavity are through the temporal area and the orbit. (iii) The force of penetration of the blunt object was obtained by the fall of the boy. In the present case though the wound of entrance was through the upper eyelid yet the eyeball was not lacerated. The direction of penetration was upwards, backwards and slightly medially. Extravasation of blood in the peri orbital tissues led to bulging of the eye. The external wound though was a trivial one without any laceration of the eyeball yet the cerebral injury was severe enough to prove fatal.

Gopalakrishnan<sup>5</sup> in their case study reported that the subject died within 2 h of the accident due to vascular injury whereas in our case the boy survived for 4 days. This is due to the fact that in the present case the floor of the frontal lobe was lacerated where

\* Corresponding author. Address: 23/12 Gariahat Road, 1st Floor Ballygunge, Kolkata, West Bengal 700029, India. Tel.: +91 9433968710.

E-mail address: [chattopadhyaydrs@rediffmail.com](mailto:chattopadhyaydrs@rediffmail.com) (S. Chattopadhyay).



Fig. 1. Perforation of the eyelid.

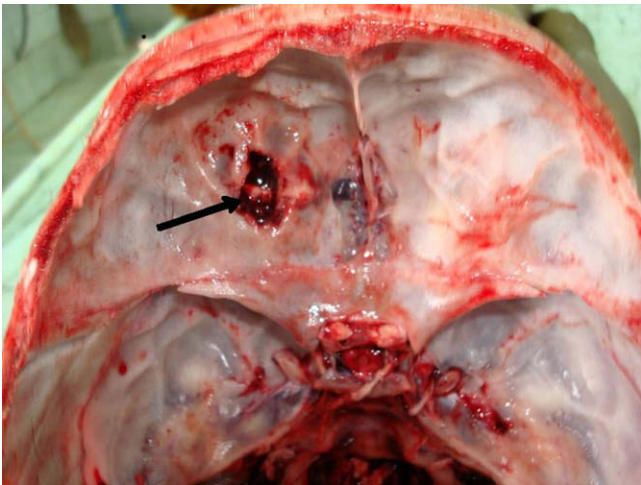


Fig. 2. Fracture of the roof of orbit.

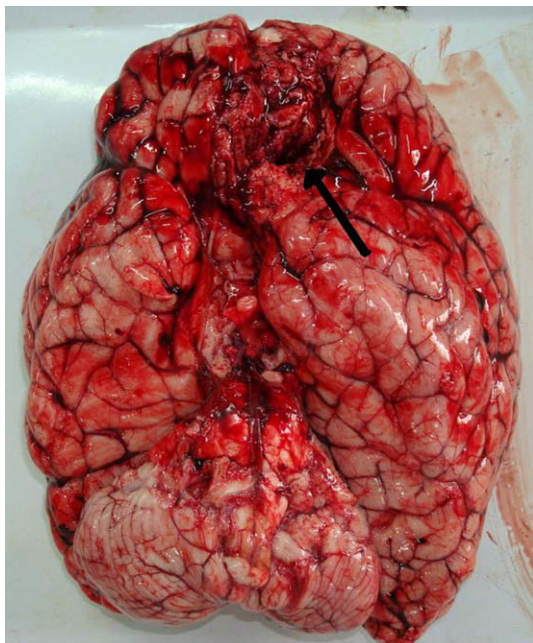


Fig. 3. Laceration of the floor of the frontal lobe of brain.

no vital center was damaged. Further no major vascular injury was noted and the subarachnoid haemorrhage was due to the laceration of the brain. Only conservative management was inadequate in the present case and surgical intervention was necessary.

Delayed deaths in penetrating head injuries are mostly due to complications like meningitis, cerebral abscess, subdural, subarachnoid and intra cerebral haemorrhage. Meningitis can occur as early as 12–24 h and upto 2–3 months after the incident.<sup>9</sup> In our case subarachnoid haemorrhage was noted but no evidence of meningitis was found. Laurel<sup>10</sup> reported three cases of transorbital penetrating injuries to the brainstem where all of them survived. Most of the cases reported where the subjects survived received specialized neurosurgical treatment.<sup>11,6</sup> Devi<sup>12</sup> in their two case reports have shown that frontal craniotomy with evacuation of haematoma, foreign body and the non viable brain followed by repair of the dura was helpful to prevent death. The present case proved to be fatal due to lack of specialized neurosurgical management in the rural setup.

#### 4. Conclusion

Orbitocerebral penetrating injuries though are associated with trivial external wounds may lead to serious consequences if not managed properly. A high degree of suspicion by the doctor is necessary to rule out major intra cerebral damage. Only conservative management by antibiotics to prevent meningitis is insufficient and definitive neurosurgical treatment is necessary to reduce mortality. Our case though was guarded of meningitis, expired due to lack of neurosurgical management.

#### Conflict of Interest

None declared.

#### Funding

None declared.

#### Ethical Approval

None declared.

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